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As binary data search methods, a method of generating a database related to binary data as search subjects and a method of performing a search by reading metadata at whatever time are known. In the former case, a search can be made at a high speed when an enormous number of search subject data are prepared. However, the method cannot easily handle changes in situations due to the addition and/or deletion of binary data. Accordingly, further proposed is a method having flexibility to changes in situations due to the addition and/or deletion of binary data by describing binary data and metadata in the same file and using the latter search method.

However, in the method of describing binary data and metadata in the same file, when an enormous amount of search subject data are provided, the speed of search processing is extremely low since a search must be made by reading files each including binary data and metadata and extracting the metadata. Especially, when a search is made for binary data stored in a storage medium with a low access speed such as a magneto-optic disk (MO), the speed of search processing is seriously reduced.

SUMMARY OF THE INVENTION

The present invention has been made in consideration of the above problems, and has as its object to enable high-speed access to metadata of binary data as a search subject. --

Rewrite the paragraph starting at page 3, line 4 and ending at page 4, line 14 as follows:

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-- According to the present invention, the foregoing object is attained by providing an information processing method for storing binary data and metadata related to binary data in a storage medium, comprising an allocation step of allocating a first storage area for metadata in advance on the storage medium, a first storage step of allocating a metadata storage area for storing metadata from the first storage area allocated at the allocation step, and storing metadata into the

metadata storage area, a second storage step of storing binary data related to metadata into a second storage area other than the first storage area on the storage medium, and a third storage step of storing link information that links metadata stored in the first storage area with binary data stored in the second storage area, in correspondence with metadata, into the first storage area, wherein at a third storage step, the link information is stored into an area adjacent to an area where metadata is stored.

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Further, the foregoing object is attained by providing an information processing apparatus for storing binary data and metadata related to the binary data in a storage medium, comprising allocation means for allocating a first storage area for metadata in advance on the storage medium, first storage means for allocating a metadata storage area for storing metadata from the first storage area allocated by the allocation means, and storing metadata in the metadata storage area, second storage means storing binary data related to metadata into a second storage area other than the first storage area on the storage medium, and third storage means for storing link information that links metadata stored in the first storage area with binary data stored in the second storage area, in correspondence with metadata, into the first storage area, wherein the third storage means stores the link information into an area adjacent to an area where metadata is stored. ~

~~Rewrite the paragraph starting at page 5, line 5 and ending at page 5, line 7 as follows:~~

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~ Fig. 2 is a schematic diagram showing the structure of binary data with metadata and form of data storage in a storage medium; --.

~~Rewrite the paragraph starting at page 5, line 19 and ending at page 5, line 21 as follows:~~

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Fig. 8 is a flowchart showing processing to allocate an area for storing metadata from the metadata storage area and storing the metadata in the area; --.

Rewrite the paragraph starting at page 6, line 9 and ending at page 6, line 12 as follows:

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As a first embodiment, an information processing apparatus and method for high-speed access to metadata in a case where binary data and metadata are stored in the same file will be described. --.

Rewrite the paragraph starting at page 6, line 24 and ending at page 7, line 7 as follows:

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A CPU 105 relates to all the processings in the above elements. A ROM 106 and a RAM 107 provide a program, data, a work area and the like necessary for processing to the CPU 105. Further, a control program necessary for all the processings is stored in the storage unit 103 or the ROM 106. In a case where the control program to be executed is stored in the storage unit 103, the program is temporarily read (loaded) onto the RAM 107 and then executed by the CPU 105. A recording unit 108, which is a device for storing binary data and metadata, is an MO, DVD-RAM or the like.

Rewrite the paragraph starting at page 7, line 14 and ending at page 8, line 8 as follows:

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Hereinbelow, first, the structure of a file in which binary data and metadata are stored will be described, then a metadata storage area in which the metadata is stored will be described, then processing to acquire the metadata storage area will be described, and finally, processing to save the file where the binary data and the metadata are stored will be described.

(File Structure)

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Fig. 2 is a schematic diagram showing the structure of binary data with metadata and a form of data storage in a storage medium. In the present embodiment, binary data is still image data in DCF (Design Rule for Camera File System) (a unified digital camera general recording format) basic file format. In Fig. 2, the binary data and the metadata construct one file, however, they are stored in different areas on a storage medium corresponding to the recording unit 108 in Fig. 1. That is, the metadata is stored in a storage area for metadata (hereinbelow, metadata storage area), while the binary data is stored in an area other than the metadata storage area (hereinbelow, general area). Further, as a file structure, metadata is attached to the end of binary data. In this manner, as a binary file and metadata are stored as the same file, linkage can be easily made between the binary file and the metadata upon file movement or deletion. --.

Rewrite the paragraph starting at page 8, line 20 and ending at page 9, line 1 as follows:

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-- In the example of Fig. 3, five attributes of metadata, "PhotoGrapher", "Date", "Location", "Event", "Keyword" are shown, and as respective data values, the name of a photographer is described for the attribute "PhotoGrapher"; the date of photo shooting, for the attribute "Date"; the location of photo shooting, for the attribute "Location"; the name of an event, for the attribute "Event"; and the name of a subject, for the attribute "Keyword". --.

Rewrite the paragraph starting at page 15, line 16 and ending at page 15, line 20 as follows:

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By the above-described processing, when one file including binary data and metadata is stored in a storage medium, the binary data can be stored in the general area 504 and the metadata, in the metadata storage area 503, respectively. ~

Rewrite the paragraph starting at page 16, line 14 and ending at page 16, line 27 as follows:

A11 Further, in an ordinary relational database, it is necessary to store a path of a search subject file and its metadata in the database. In this case, upon movement and/or deletion of file, the content of the database must be updated. On the other hand, according to the present embodiment, as metadata and binary data are stored in one file such that a search for the metadata attached to the binary data is made, the above-described processing upon file movement and/or deletion can be omitted.

Further, in the above embodiment, the link information is stored in the metadata storage area, however, it may be arranged such that all the link information are registered in a database.

In the Abstract

Rewrite the paragraph starting at page 33, line 3 and ending at page 33, line 16 as follows:

A12 When binary data and metadata related to the binary data are stored in a storage medium, a metadata storage area is allocated in advance on the storage medium. Then a storage area is allocated for storing the metadata from the head of the metadata storage area, and the metadata is stored in the allocated area. On the other hand, the binary data related to the metadata is stored in a general area other than the metadata storage area. Then link information which links the metadata and the binary data is written, in correspondence with the metadata, in the metadata storage area. As all the metadata are stored in the specialized storage area, the metadata attached to the binary data can be accessed at a high speed.

REMARKS

The Specification and the Abstract for the above-identified application has been amended to correct grammatical and typographical errors. A marked-up version of the